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THE SURGICAL TREATMENT
OF
APPENDICITIS
AND ITS LIMITS.

Read at the Clinical Meeting of the Alumni of the Jefferson Medical College, November 12, 1892.

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The Surgical Treatment of Appendicitis and its Limits.

THE paper which I have the honor of presenting for your consideration this evening is on the surgical treatment of appendicitis and its limits.

I shall not discuss operative details nor touch upon medication, except so far as it refers to diagnostic indications for surgical interference. The scope of my paper, therefore, is a limited one, and deals simply with the question of when to operate.

There is probably no intraperitoneal disease which causes at times more perplexity in the mind of the surgeon than a lesion of the appendix. The question of relief without the aid of the knife, the uncertainty of operative results, and the traditions of the past all combine to obscure our judgment, or, perchance, to stay our hand at a time when surgery is most needed.

From a surgical stand-point the treatment of appendicitis may be studied under three headings,—viz., 1, the question of abdominal section in mild cases; 2, the treatment of recurrent attacks; 3, the indications for immediate operative interference during an acute attack.

Let us first consider what should be the position of the surgeon in a primary attack

of appendicitis presenting no symptoms indicating the necessity for an immediate operation. The dangers to life during the course of the disease are from extension of the inflammation to the peritoneum, from perforation of the appendix, or from a local or general gangrene. If it were possible to know at the beginning of an attack the true state or condition of the appendix, the question of operative interference would be a simple matter. It is true that in some instances we are able to appreciate the presence of dangerous developments occurring at the seat of disease, but there are no symptoms to indicate the possibility of these fatal complications arising. It may be that the disease will end in resolution, and the patient recover permanently, or for a longer or shorter period. On the other hand, perforation may occur, and a rapidly fatal peritonitis develop, unless the general peritoneal cavity be protected by adhesions. Therefore it is not in the power of any surgeon to know what the course of a primary attack of appendicitis will be. "In a series of eleven cases, with ten recoveries, recently reported by McBurney,* an operation was performed in from forty hours to seven days. In nine of the eleven cases the appendix was removed. Pus was found in seven or more. In one case, operated on forty-nine hours after pain was first noticed, the appendix consisted of a thin-walled sac, shut off from the cæcum, and containing half an ounce of fetid pus." In a case operated on by Lange†

* *Medical and Surgical Reporter*, September 19, 1891.
W. L. Conklin.

† *Ibid.*

"not only perforation but extensive destruction of the appendix and far-gone infection of the peritoneum had been found by the middle of the second day." At the Cook County Hospital, of Illinois,* a patient was operated upon forty-eight hours after the beginning of the attack. There were found soft adhesions between the surrounding coils of intestines, and the appendix contained two small concretions the size of a cherry-stone. On the wall of the appendix opposite these concretions was a gangrenous spot the size of a dime. Study† reports an interesting case of death in forty-eight hours from the first complaint of pain. The autopsy revealed diffuse purulent peritonitis, with two perforations at the base of the appendix. In a patient of Dr. John Graham's, of this city, upon whom I operated successfully on the fourth day, a large circumscribed abscess was found, and an opening into the head of the colon large enough to admit two fingers.

These cases not only show the impossibility of determining the actual pathologic changes present during an attack of appendicitis, but they at the same time point to the dangers to which a patient must necessarily be exposed if surgical interference be delayed until the symptoms demand immediate interference. Macewen says that twelve hours are sufficient "for the development of extensive and serious peritonitis following this small disease." The truth of this statement cannot be doubted. Surely the case I have

* *Annals of Surgery*, vol. xv., No. 5, p. 355.

† *Medical Record*, February 7, 1891, p. 166.

just quoted, where death occurred in forty-eight hours from diffuse purulent peritonitis, is a positive proof, if any be needed, of the dangers to life from gangrene and rapid perforation of the appendix. Had this patient been operated upon at the beginning of the attack, his life would, in all probability, have been saved. Waiting, however, until the peritoneum had become generally infected, death must have resulted with or without an operation. The operative mortality in diffuse purulent peritonitis is one hundred per cent. at the present day ; these cases, therefore, offer no hope even if operated upon. Again, McBurney's case of a distended appendix containing fetid pus is most instructive. Here was present half an ounce of highly infectious material, separated only from the general peritoneal cavity by the thin and over-distended walls of the appendix, likely at any moment to rupture and cause a diffuse septic inflammation ; and this condition developed within forty-nine hours after pain was first noticed. Now, the only rational conclusion to be drawn from this case is that the patient was in imminent danger of death after the first few hours of the disease, although the indications for operative interference did not manifest themselves until later.

What, may I ask, do cases such as I have referred to teach us ? To my mind the answer is a ready one,—namely, that no case of appendicitis can be considered mild in type unless the surgeon knows without a doubt the pathologic conditions present at the seat of disease. As this is an absolute impossibility with our present means and knowledge of

diagnosis, we must, therefore, look upon all cases as being imminently dangerous to life from the very beginning of the attack. Furthermore, is it a safe rule to establish that the patient is safe up to the second or third day of the disease, because in a large proportion of cases dangerous symptoms are not present until that time? Personally, I can admit of no such view of the subject, when so many cases are on record where the patient has practically passed beyond human aid within a few hours after the initial symptoms of the attack began. Notwithstanding, however, that we are unable to know what will be the course of the disease in a given case, and that pathologic conditions may be present in the appendix, of which we have no knowledge or means of knowing, yet of sufficient malignancy in themselves to end the case fatally within a few hours, the question of operation at the beginning of an attack is, I admit, not only a serious one, but presents at the same time many difficulties in the way of a decision. My personal belief is that, as soon as a diagnosis of appendicitis is *clearly made*, the case should be operated upon and the appendix removed. I do not wish, however, to be understood as advocating operation for any pain which may occur in the right iliac fossa. In the mild types of the disease under discussion, a diagnosis before twenty-four hours is not possible. Therefore, when I advocate operation as soon as the diagnosis is *clearly made*, it is at a time when not only the nature of the case can be correctly decided upon, but the results of the medical treatment demonstrated as well.

I should not insist upon operation under these circumstances, for I believe that the surgeon has fulfilled his duty when he explains to the patient or to the family the nature of disease and the danger of grave complications arising. The question, therefore, of surgical interference must be settled by them. Should they decide against an operation, and are willing to take the chances of the disease continuing mild in type, it is our duty then to carefully watch the case for the development of dangerous symptoms indicating immediate interference.

In cases of recurrent attacks of appendicitis, the question of operation, to my mind at least, is not a difficult one to decide. A secondary attack means, almost to a certainty, that the cause of the original inflammation is still present in the appendix, and that it is a permanent one, likely at any time to jeopardize the life of the patient. Again, as in the case of a primary attack, we have no means of knowing what the course of the inflammatory process may be, nor can we determine the pathologic conditions present. Therefore the only rational deduction which may be drawn from these facts is, that an operation should be performed as soon as the diagnosis is made.

In the majority of cases of recurrent appendicitis operated upon, an examination of the appendix shows that the cause for the inflammation is due to conditions which have no natural tendency towards recovery. Fæcal concretions, foreign material, organic strictures, or distention of the appendix due to pus or to catarrhal products, are present in

these relapsing forms of the disease. An appendix the seat of any of these pathologic alterations is an organ diseased beyond repair, and one that is a constant danger to life. Permit me to refer to the following cases as bearing directly upon this subject. Sutton* operated upon a man 22 years old, and removed the appendix. The patient had three attacks previously within two years. The appendix was found slightly adherent to the brim of the pelvis. Its lumen was obstructed. The appendix below the stricture was filled with pus. Maylard† reported the case of a man, 21 years old. He had four attacks within ten months, two so severe as apparently to threaten life. There was found upon operation a deeply-attached and distended appendix. Mayo Robson's‡ case had fourteen attacks within one year and a half. The appendix was found to be strictured and dilated, and buried in the midst of firm adhesions. Bernardy's§ case was operated upon during the tenth attack. He found numerous and dense intestinal adhesions around the cæcum. The appendix contained pus, and "an inch above and behind the cæcum, buried deep down, was a small pus sac."

It is unnecessary to take up your time by further reference to cases in order to prove that a recurrent attack of appendicitis is a

* Meeting of Clinical Society of London, February 13, 1891.

† *British Medical Journal*, May 9, 1891.

‡ Leeds and West Riding Medico-Chirurgical Society, November 6, 1891.

§ *Transactions of the Philadelphia County Medical Society*, 1889.

warning not to be lightly regarded by the surgeon. Whatever may be our views regarding the surgical treatment of a primary attack, it does not seem in reason that they should influence us in the management of a recurrent case. In the former there is always the possibility that the disease may not return, but in the latter we can have no just grounds for such a hope. There are but two terminations, in the vast majority of cases, in relapsing forms of appendicitis,—*one is death, the other operation*. Sooner or later one or the other must happen.

We pass now to a consideration of the indications for immediate operation during the course of an acute attack of appendicitis. These may be divided into two classes,—first, those which are determined by the results of the medical treatment; and, second, those which are pointed out by the local or general symptoms.

Medical treatment must result in prompt amelioration of symptoms, if it be doing good in an attack of appendicitis. Hoping from hour to hour, or from day to day, that improvement will take place is not only subjecting the patient to great dangers, but it is, at the same time, accomplishing but little good. If, therefore, the use of salines or calomel, followed by an enema, do not result in decided improvement within twenty-four hours, an operation should be considered. It is only in cases which are mild in type from the onset that medical treatment is justifiable, and the improvement to be looked for under these circumstances consists in lowering of the pulse, decrease in the temperature, lessening

of the local pain, and free evacuations. Mr. Sutton* operated upon a boy, 19 years old, who presented typical signs of typhlitis. "Under medical treatment he seemed to improve; but in the course of three weeks the presence of pus was clearly indicated. An operation revealed a large quantity of pus in the iliac fossa. The tip of the appendix had sloughed." Although this patient fortunately recovered, we must admit that his life had been in imminent danger, and that an operation should have been performed earlier simply from the fact that medical treatment failed to produce prompt and decided results.

One word in reference to the use of opium in the treatment of appendicitis. It is impossible for the first few hours of the disease, or, at least, until the salines have begun to act, to do without this drug in one of its forms. It should be remembered, however, that, unless it be used with care and in the smallest possible doses, the symptoms will be so disguised that they cannot be correctly estimated.

The local or general symptoms, which indicate the necessity for immediate operation, are at times so uncertain and unreliable, that the gravest doubts may exist as to their true meaning. Yet, notwithstanding this fact, there are certain symptoms, which, if present, point to the urgency for surgical interference. These are increasing pain in the right iliac fossa, continued elevation of temperature, rapid pulse, tumor over the region of the appendix,

* Meeting of Clinical Society of London, February 13, 1891.

and abdominal distention. The presence of all or any of these conditions indicate that the inflammatory process is active, and likely at any moment to develop grave symptoms. For example, the existence of a tumor in the right iliac fossa may be due to an inflammatory exudation, to adhesions, or to pus. As it is impossible in the early period of its development to determine with any degree of certainty its true nature, we should look upon the condition with suspicion, and operate at once, to anticipate, if possible, the formation of an abscess. The following case* illustrates this point: The patient, a male, 30 years old, was operated upon the seventh day of the disease. The attack began with severe pain across the abdomen, especially marked, however, in the right iliac fossa. The symptoms gradually improved until at the time of the operation, when only slight tenderness could be felt by touch over the situation of the appendix, and a tumor occupying the right iliac fossa. The bowels were regular. An operation revealed "adhesions between the peritoneum and omentum, which later covered and was bound to the seat of inflammation. At the ileo-cæcal region the intestines were much congested and adherent. The appendix was congested, and swollen to the size of the little finger. Near its base was a small ulcerated opening, and about it a few ulcerated spots of beginning suppuration, yet no actual pus cavity." In this case the existence of the tumor was the only indication for operation. The true nature of the

* *Annals of Surgery*, vol. xv., No. 5, p. 355.

enlargement, however, could not be determined until the appendix had been exposed. It is evident, therefore, that a diagnosis was impossible prior to section, and that the mere presence of a tumor should be an indication for operation. If this be true, the same line of reasoning will hold good in the other conditions to which I have referred. They all indicate activity at the seat of disease, yet none of them reveal the pathologic conditions present.

In all cases where the symptoms point to gangrene or perforation of the appendix, to the presence of pus, to bowel obstruction, or to peritonitis, the indication is for an immediate operation. I desire, however, to emphasize this fact,—namely, that we expose the patients to great danger by waiting for these complications to develop, because it may then be too late to save life, and, again, the symptoms themselves may fail to show the true conditions present within the abdominal cavity.

The following case, which I saw in consultation with my friend, Dr. Fries, of this city, demonstrates, to my mind at least, the uncertainty of diagnosis in intraperitoneal disease :

The patient was a male, 37 years old. Following an unusual effort in lifting, an old inguinal hernia upon the right side became incarcerated. Dr. Fries was called to the case on November 2, and found the patient in a condition of shock. One hour after he had returned the bowel, the patient's condition was normal, except a slight attack of vomiting.

October 3.—The temperature and pulse were normal. There was slight abdominal tenderness, but no tympany. Early in the day the patient had two bloody stools, which were followed, however, at noon, by a large normal evacuation.

October 4.—His condition was entirely normal.

October 5.—Up to 11 A.M. the condition was normal. At that time he vomited, and again at 2 and 4 P.M., when it was faecal in character. I first saw the patient at 5 P.M. His condition was as follows: Temperature, normal; pulse, 90; very slight tympany or abdominal tenderness. A diagnosis of obstruction, due probably to a kink in the bowel, was made, and section advised. Upon opening the abdomen, we found a diffuse purulent peritonitis and an obstruction in the upper part of the ileum. About three feet of the gut had been bunched together, and two complete twists had been made in its mesentery. The intestine had become gangrenous from the cutting off of the circulation. Although the patient had been upon the table but a few minutes, he died almost immediately from shock, after the mesentery had been untwisted.

In conclusion, I desire to call attention to the following points:

1. That we must consider all cases of appendicitis as being imminently dangerous to life from the beginning of the attack, as there are no means of determining the exact pathologic conditions present at the seat of disease.

2. That operative interference is indicated

in mild cases, if medical treatment fails, within twenty-four hours, to produce a decided improvement in the symptoms.

3. That all cases of recurrent appendicitis should be operated upon as soon as the diagnosis is clear.

4. That increasing pain in the right iliac fossa, rapid pulse, continued elevation of temperature, tumor, and tympany are conditions indicating immediate operation.

5. That it is unsafe to wait before operating for the development of symptoms indicating gangrene or perforation of the appendix, pus, bowel obstruction, or peritonitis.

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